

Office Action Summary

Application No.

10/565,696

Applicant(s)

HAYASHI ET AL.

Examiner

RICHARD A. HUHNS

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4-8 and 11-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-8 and 11-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-850/8)
- 4) ☒ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 2 June 2009, 23 June 2009

DETAILED ACTION

1. Any rejections and/or objections made in the previous Office action and not repeated below are hereby withdrawn.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office Action.
3. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1 June 2009 has been entered.

Double Patenting

4. Claims 1-17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of copending Application No. 11/628172.
5. This rejection was adequately set forth in the Office action mailed on 2 March 2009, and is incorporated here by reference. See also paragraph 24 below.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 4-8, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent No. 2003-223001 (herein "Sato"). Since Sato is in a non-English language, a machine translation of the cited reference is relied upon and all citations to Sato's teachings are made with reference to the machine translation. Note that the machine translation was provided with the Final Rejection mailed on 2 March 2009.

9. As to claim 1: Sato discloses resins for resists (see paragraph 1) which comprise the following structural units derived from (alpha-lower alkyl)acrylate esters:

- a. acrylates according to instant formula (a1-2) in which the acid dissociable, dissolution inhibiting group may be monocyclic: see paragraph 13, which

discloses the acrylate portion of the monomer; paragraphs 15, which discloses the alkyl-substituted monocyclic ring portion of the monomer in formula pl; paragraph 16, which discloses group R11=ethyl, as is presently recited; paragraph 31, which discloses monocyclic rings; and paragraph 34, which discloses a cyclohexyl ring as a particular monocyclic ring;

b. acrylates according to instant formula (a2-1) (see the formulas IV-1 and IV-3 in paragraph 102);

c. acrylates according to instant formula (VIII) in which one hydroxyl group is bonded to the 3-position of the adamantyl group (see the two top-most formulas in paragraph 62).

10. Sato further teaches that the monomers of the instant formulas may be acrylates or methacrylates (see paragraphs 14, 62, and 102), corresponding to the instant formulas in which R=hydrogen or methyl, respectively.

11. Sato fails to specifically name the presently recited resin. However, Sato teaches that each of the monomers which are presently recited may be copolymerized to form resins for resists. Therefore, a person of ordinary skill would have been motivated to prepare resins with any of the monomers which are disclosed or suggested by the reference. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the present invention to have made any of the resins suggested by Sato, including resins made with the presently recited monomers, thereby arriving at the presently claimed invention.

12. As to claim 4: Sato further discloses acrylates which comprise polycyclic aliphatic hydrocarbon groups which are different from those applied above to claim 1 (see, for example, the formulas in paragraph 43).

13. As to claim 5: Sato further discloses that the resin compositions include acid generators, and that the resins disclosed therein exhibit increased alkali solubility upon reaction with the acid (see the last 8 lines of paragraph 3).

14. As to claim 6: Sato further discloses that the resin composition may include nitrogen containing compounds such as amines (see paragraphs 176-177).

15. As to claim 7: Sato further discloses the presently recited method of forming a resist pattern, including forming a resist film from the resins disclosed therein, selective laser exposure, and alkali development (see paragraph 199 for an example).

16. As to claim 8: Sato discloses resins for resists (see paragraph 1) which comprise the following structural units derived from (α -lower alkyl)acrylate esters:

d. acrylates according to instant formula (a1-2-1) in which the acid dissociable, dissolution inhibiting group may be monocyclic: see paragraph 13, which discloses the methacrylate portion of the monomer; paragraphs 15, which discloses the alkyl-substituted monocyclic ring portion of the monomer in formula pl; paragraph 16, which discloses group R11=ethyl, as is presently recited; paragraph 31, which discloses monocyclic rings; and paragraph 34, which discloses a cyclohexyl ring as a particular monocyclic ring;

- e. acrylates according to instant formula (V) (see the formulas Ib-1 in paragraph 78);
 - f. acrylates according to instant formula (VIII) in which one hydroxyl group is bonded to the 3-position of the adamantyl group (see the two top-most formulas in paragraph 62).
17. Sato further teaches that the monomers of the instant formulas may be acrylates or methacrylates (see paragraphs 14, 62, and 102), corresponding to the instant formulas in which R=hydrogen or methyl, respectively.
18. Sato fails to specifically name the presently recited resin. However, Sato teaches that each of the monomers which are presently recited may be copolymerized to form resins for resists. Therefore, a person of ordinary skill would have been motivated to prepare resins with any of the monomers which are disclosed or suggested by the reference. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the present invention to have made any of the resins suggested by Sato, including resins made with the presently recited monomers, thereby arriving at the presently claimed invention.
19. As to claim 11: Sato further discloses acrylates which comprise polycyclic aliphatic hydrocarbon groups which are different from those applied above to claim 1 (see, for example, the formulas in paragraph 43).
20. As to claim 12: Sato further discloses that the resin compositions include acid generators, and that the resins disclosed therein exhibit increased alkali solubility upon reaction with the acid (see the last 8 lines of paragraph 3).

21. As to claim 13: Sato further discloses that the resin composition may include nitrogen containing compounds such as amines (see paragraphs 176-177).

22. As to claim 14: Sato further discloses the presently recited method of forming a resist pattern, including forming a resist film from the resins disclosed therein, selective laser exposure, and alkali development (see paragraph 199 for an example).

Response to Amendment

23. Applicant's amendment of claim 1 to include limitations of previously presented claims 2, 3, and 15-17 and the corresponding cancellation of claims 2, 3, and 15-17, is acknowledged. Applicant's amendment of claim 8 to include limitations of previously presented claims 9, 10, and 15-17 and the corresponding cancellation of claims 9, 10, and 15-17, is acknowledged.

24. The terminal disclaimer filed on 1 June 2009 has been reviewed. However, the application/patent being disclaimed has been improperly identified. The application being disclaimed has been indicated as 10/566,425, whereas the correct number is 10/565,696. The terminal disclaimer has not been entered, and the double patenting rejection which was set forth in the Office action mailed on 2 March 2009 is maintained. This was discussed in a telephone interview with Neil Bartfeld on 22 June 2009; an interview summary form is attached to this Office action.

Response to Arguments

25. Applicant's arguments (Remarks filed 1 June 2009) have been fully considered and are persuasive in part.

26. Applicant argues (first paragraph of page 8 of Remarks) that Sato fails to disclose the specific resin of amended claim 1. This argument is persuasive, and therefore the rejection of claims 1-17 as anticipated by Sato is withdrawn. However, a new grounds of rejection in view of Sato is set forth above.

27. Applicant argues (last paragraph of page 9 to page 10 of Remarks) that Sato cannot attain the effects of the present invention because all of the examples of Sato disclose polycyclic aliphatic hydrocarbon groups as the acid dissociable, dissolution inhibiting group, instead of the monocyclic aliphatic hydrocarbon groups (and specifically cyclohexyl groups) which are presently claimed. However, it is noted that the present invention may also employ polycyclic aliphatic hydrocarbon groups (as recited in claims 4 and 11, for example). It is further noted that disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP 2123). Therefore, the presence of polycyclic aliphatic hydrocarbon groups in the exemplary resins of Sato is not considered a sufficient showing that the resins of Sato cannot produce the effects of the present invention.

28. Applicant further argues (first full paragraph on page 10 of Remarks) that it would not have been obvious to a person of ordinary skill to select the specific structural units which are presently claimed out of the disclosure of Sato. However, as is noted above in paragraph 7(a), Sato discloses monocyclic aliphatic hydrocarbon groups which are according to the present invention. A person of ordinary skill would have been motivated to use any of the monomers which are disclosed or suggested by Sato. The breadth of the disclosure is not considered a teaching away from any of the particular aspects of the disclosure. Also, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP 2123). The examiner maintains that it is *prima facie* obvious to use any of the monomers disclosed or suggested by Sato for resins in photoresists, including those which are presently claimed, by virtue of the monomers having been named by the reference for this purpose.

29. Applicant further argues (first and second full paragraph on page 10 of Remarks) that the presently claimed invention provides unexpected results which a person of ordinary skill would not have recognized from the disclosure of Sota. Applicant has provided a Rule 132 Declaration to this effect, which is further discussed on pages 10-14 of Remarks. This evidence is found unpersuasive for at least the following two reasons.

30. Firstly, it is noted that the examples which are provided in the Declaration include resins which (1) comprise a monocyclic aliphatic hydrocarbon group but do not comprise a polycyclic aliphatic hydrocarbon group (see formula Ex-1 on page 3 of Declaration), and (2) comprise a polycyclic aliphatic hydrocarbon group but do not comprise a monocyclic aliphatic hydrocarbon group (see formula Ex-2 on page 6 of Declaration). Therefore, these exemplary resins do not account for the possibility that the resin may contain *both* a monocyclic and a polycyclic aliphatic hydrocarbon group. In fact, this particular situation arises in instant claims 4 and 11. Furthermore, because each of the presently recited monomers, including the monocyclic ones according to the independent claims 1 and 8, and including the polycyclic ones according to dependent claims 4 and 11, are taught by the reference, a person of ordinary skill would have reasonable motivation to combine these different monomers by virtue of the monomers having been named by the reference for the presently claimed purpose. Furthermore, because the examples provided in the Declaration do not account for the possibility that the resin may contain *both* a monocyclic and a polycyclic aliphatic hydrocarbon group, this data is not commensurate in scope with all of the presently recited claims, especially claims 4 and 11. For these reasons, Applicant's argument that the presently claimed invention provides unexpected results over Sato is found unpersuasive.

31. Secondly, although the examples demonstrated in the Declaration (see Table A on page 5, and Table B on page 8 of the Declaration) do show a difference in the depth of focus and the like between the examples, this difference is not considered sufficiently different so as to be considered unexpected. An improvement over the prior art still may

not be patentable if it was within the capabilities of one skilled in the art, unless there is an unexpected result that is different in kind, not just in degree, from the results of the prior art. *In re Huang*, 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996). A person of ordinary skill would reasonably infer from the full disclosure of Sato that the physical properties of the resins disclosed therein could be optimized by an appropriate selection of monomers, and by the use of appropriate relative amounts of the monomers. Therefore, a person of ordinary skill could arrive at the presently recited improved properties by making appropriate selections from Sato which are within the ordinary level of skill in the art. For these reasons, Applicant's argument that the presently claimed invention provides unexpected results over Sato is found unpersuasive.

32. Applicant argues (pages 15-16 of Remarks) that US 2002/0068238 does not anticipate the present claims as amended, because the reference fails to teach the subject matter of previously presented claims 2 and 9, which subject matter has now been incorporated into the independent claims 1 and 8. This argument is persuasive, and therefore the rejection of claims 1, 3-8, 10-14, and 16-17 as anticipated by US 2002/0068238 is withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RICHARD A. HUHNS whose telephone number is (571) 270-7345. The examiner can normally be reached on Monday to Friday, 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. A. H./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796